

PATENT CLAIMS (as originally filed)

1. A liquid trap (10), in particular for collecting liquids in a vacuum device, with a trap container (11), which has an inner space (12) and a inflow element (13), through which liquid can enter from an outer space (20) of the trap container (11) into the inner space (12) of the trap container (11), characterized in that the inflow element (13) is formed by an inlet channel (15) in a wall (14) of the trap container (11), wherein the inflow channel (15) has an inner diameter (D) with  $D < 2 \text{ mm}$  and an inner length (L) with  $L < 4 \text{ mm}$ .
2. The liquid trap according to claim 1, in which the inlet element (13) has a conically shaped outer wall, which projects in a tapered manner from the wall (14) into the outer space.
3. The liquid trap according to claim 2, in which the outer wall forms an angle of less than  $70^\circ$  relative to the wall (14) of the trap container (11).
4. The liquid trap according to claim 2 or 3, in which the outer wall forms an angle greater than  $45^\circ$  relative to the wall (14) of the trap container (11).
5. The liquid trap according to one of the preceding claims, in which the diameter (D) is selected to be in the range of  $1 \text{ }\mu\text{m}$  to  $1 \text{ mm}$ .
6. The liquid trap according to claim 5, in which the diameter (D) is selected to be in the range of  $5 \text{ }\mu\text{m}$  to  $100 \text{ }\mu\text{m}$ .

7. The liquid trap according to one of the preceding claims, in which the length (L) of the inlet channel (15) is less than the doubled diameter (D).
8. The liquid trap according to one of the preceding claims, in which a heating device (30) is provided, with which the inflow element (13) is temperable.
9. The liquid trap according to one of the preceding claims, in which a first adjusting device (40) is provided, with which the diameter (D) of the inlet channel (15) can be adjusted.
10. The liquid trap according to one of the preceding claims, in which a second adjustment device (50) is provided, with which the position of the liquid trap in the outer space is adjustable.
11. The liquid trap according to one of the preceding claims, in which the inflow element (13) represents an exchangeable component.
12. A vacuum device (60) with  
a vacuum chamber (61),  
a liquid source (62), with which liquid can be supplied into the vacuum chamber (61), and  
a liquid trap (10, 63) according to one of the preceding claims 1 through 10.
13. The vacuum device (60) according to claim 12, in which the liquid trap can be set as a module in a wall of the vacuum chamber.
14. The vacuum device (60) according to claim 13 or 14, which includes a plasma Röntgen source, a mass spectrometric analytical device, or a device for molecular distillation.

15. The vacuum device (60) according to one of claims 12 to 14, which has an adjustment device (68), with which the liquid source (61) and the liquid trap (62) can be aligned relative to one another.
16. A method for collecting a liquid in drop-, jet-, or particle form with a predetermined radius (R) in a vacuum device (60) with a vacuum chamber (61) and a liquid trap (10), which has a trap container (11) with an inner space (12) and an inflow element (13), through which the liquid enters from the vacuum chamber (61) into the inner space (12) of the trap container (11) and vapor of the liquid flows from the trap container (11) into the outer space, characterized in that liquids with a radius (R) in the range of 1  $\mu\text{m}$  to 100  $\mu\text{m}$  and vapor pressures in the range of 1 kPa to 100 kPa are collected, and the liquid is moved through an inlet channel (15), which is formed by the inflow element (13) and having an inner diameter (D) with  $D < 20R$  and an inner length (L) with  $L < 2D$ .
17. The method according to claim 16, in which a gas atmosphere, which surrounds the liquid before collection, is reversed upon entry of the liquid into the inlet channel (15) by a conical outer shape of the inflow element (13).
18. The method according to claim 16 or 17, in which the inflow element (13) is heated at least at the beginning of the collection of the liquid.
19. The method according to one of the preceding claims 16 through 18, in which the liquid is collected in the liquid trap at ambient temperature.

20. The method according to one of the preceding claims 16 through 19, in which the liquid is collected after an irradiation for plasma-based production of Röntgen radiation or after separation from a substance to analyze in a mass-spectrometry analytical device.